bp

BP Products North America Inc.
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February 18, 2014

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Director, Air Enforcement Division
Office of Civil Enforcement (2242A)
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20004

Compliance Tracker (AE-17J)
Air Enforcement and Compliance Assurance branch
U.S. EPA, Region 5
77 W. Jackson Blvd.
Chicago, IL 60604

Office of Regional Counsel
U.S. EPA, Region 5
77 West Jackson Blvd. (C-14J)
Chicago, IL 60604

Re: **United States, et.al. v. BP products North America Inc.**
Northern District of Indiana, Hammond Division
Civil Action No. 2:12 CV 207
Benzene Waste NESHAP "End-of-Line" (EOL) Sampling Plan Update

EPA APPROVAL REQUIRED: Information is being submitted for approval purpose.

In accordance with ¶ 58.d of the referenced Consent Decree, attached is a newly proposed revised EOL Sampling Plan.

If you require additional information, please contact Tim Chen at (219) 473-1286.

Sincerely,

Linda Wilson

Linda Wilson
Environmental Manager
BP Whiting Refinery

Attachment

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Submitted hard-copy:

cc w/o attachment:

Chief
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Ben Franklin Station
Washington, DC 20044-7611
Reference Case No. 90-5-2-1-09244

cc w/ attachment:

Office of the Indiana Attorney General
Environmental Litigation Division
Indiana Government Center South- Fifth Floor
302 West Washington Street
Indianapolis, IN 46204

Chief, Air Compliance and Enforcement Branch
Indiana Department of Environmental Management
100 North Senate Avenue
MC 61-53, IGCN 1003
Indianapolis, IN 46204-2251

End of Line Benzene Waste Sampling Plan

BACKGROUND AND PURPOSE OF THIS DOCUMENT

The purpose of the plan is to identify the end-of-line sampling locations and methods of flow determination that will be used to calculate the quarterly benzene quantity at the BP Whiting Business Unit subject to the control requirements of 40 CFR Part 61, Subpart FF. The plan will be used to assist facility personnel in implementing the end-of-line benzene determination program. The plan is maintained as a requirement of the current 2012 Consent Decree, Paragraph 58 [Sampling (6 Mg/yr)]. This document describes the plan which was originally submitted to USEPA on the letter dated May 18th, 2001 and has ben maintained and updated as appropriate to reflect uncontrolled benzene.

Uncontrolled Waste Management System

The uncontrolled waste management system includes the following components:

- Water draws from distillate tanks (ITF, STF, J&LTF, SPTF, Marketing Terminal)
- Uncontrolled process units (ALKY, HU, PCU, SRU)
- Miscellaneous uncontrolled waste streams from other process units.
- Cooling Tower blow down Water
- Unexpected and non-routine heat exchanger leaks in the Once-through Cooling Water systems.
- Turnaround and solid waste generated during routine maintenance activities
- Tank 5050
- East French Drain Remediation System
- West French Drain Remediation System
- J-141A and J-157 Remediation Systems
- JL3 West Ditch French Drain System
- Marketing Terminal storm water
- Lakefront solids handling (e.g. DAF Float and API or DAF de-sludging) system.

END-OF-LINE BENZENE WASTE SAMPLING LOCATIONS

BP Whiting Refinery has designated more than ten (10) benzene concentration-sampling locations so far. Figure 1 depicts the end-of-line benzene waste sampling locations. Table 2 below summarizes general information about the end-of-line current sampling locations. Appendix C summarizes the EOL historical sampling locations which are no longer needed.

TABLE 2
END-OF-LINE SAMPLING LOCATIONS

Location I.D.	Location Description	Waste Stream Description
001A	In Tank 908 sump	Oil phase from the uncontrolled distillate tank water draws in J&L tank field
001B	In Tank 908 sump	Water phase from the uncontrolled distillate tank water draws in J&L tank field
001C	J&L Separator water sump pump outlet	Water from Fire Training Field, 918 Lift Station and #3 Outfall
002A	ITF Casper Dewatering Unit sump	Oil phase from the uncontrolled distillate tank water draws in ITF tank field
002B	ITF Casper Dewatering Unit sump	Water phase from the uncontrolled distillate tank water draws in ITF tank field
003	Between the SRU's Tower 401and the process sewer	Sour water stripper effluent
005	Influent to Tank 5050	Wastewater
006A	#7 API Separator (infrequently generated)	API separator sludge
006B	DAF Float	DAF Floatation Materials
008	Waste Containers	Turnaround and routine solid wastes
011A	Marketing Terminal Sump	Product drippings collected in sump
011B	Marketing Terminal Sump	Stormwater collected in sump
012A	Between the J-157 Remediation System and the process sewer	STF remediation system oil
012B	Between the J-157 Remediation System and the process sewer	STF remediation system water
013A	Between the J-141A Remediation System and the process sewer	J&L remediation system oil

TABLE 2
END-OF-LINE SAMPLING LOCATIONS

Location I.D.	Location Description	Waste Stream Description
013B	Between the J-141A Remediation System and the process sewer	J&L remediation system water

Note: The skipped numbers in the location IDs are these historical sampling locations no longer needed. Please refer to Appendix C for a list of historical sample locations.

METHODS OF FLOW DETERMINATION

Benzene waste flow rates will be determined by direct measurement procedures or engineering calculations using run-time on hour meters for the various pumps and their respective pump capacities, as appropriate, for all sampling locations except for the marketing terminal. The uncontrolled sump at the Marketing Terminal collects stormwater runoff and product drippings from the loading rack. Fluids collected in this sump are pumped to the Indiana Casper Dewatering System, located in the Indiana Tank Field. Since pump run time indicators are not currently installed on this sump, the flow has been estimated equal to the total flow through the Indiana Casper Dewatering System. This is considered to be a conservative assumption.

Table 3 below summarizes information about the methods of flow calculations, by sampling location.

All distillate tank water draws from the STF drain to the uncontrolled portion of the refinery process sewer located in that field. There is no location on this sewer to appropriately sample this waste stream. Data obtained from sampling points 002A, and 002B is used to calculate benzene waste quantity from all uncontrolled distillate tank water draws, including water draws from tanks discharging directly (via multiple lines) into the controlled process sewer. The flow contribution for a typical distillate tank will be determined by dividing flow data gathered from sample point 002 by the number of tanks contributing to that flow. The calculated average flow will then be assigned to the distillate tank water draws that discharge directly to the uncontrolled section of the process sewer in STF. Benzene concentrations from sample point 002, in both the water and oil phases will be used in a similar manner to determine typical benzene concentrations.

TABLE 3
METHODS OF FLOW DETERMINATION

Location I.D.	Flow Determination Methodology
001A	Calculation based on total fluids pump capacity and run-time as measured by "hour meters". The oil phase quantity is estimated from oil/water level readings.
001B	Calculation based on total fluids pump capacity and run-time as measured by "hour meters". The water phase quantity is estimated from oil/water level readings.
001C	Calculation based on pump capacity and run-time as measured by "hour meters".
002A	Calculation based on oil pump capacity and run-time as measured by "hour meters".
002B	Calculation based on total fluids pump capacity and run-time as measured by "hour meters", and material balances.
003	Flow meter
005	Calculations based on the recorded tank water impoundment events
006A	Calculations based logged volume estimate
006B	Calculations based consistent average flow estimate
008	Waste offsite disposal volume
011A	The flow has been estimated equal to the total flow through the Indiana Casper Dewatering System.
011B	The flow has been estimated equal to the total flow through the Indiana Casper Dewatering System.
012A	Calculation based on total fluids pump capacity and run-time as measured by "hour meters". The oil phase quantity is estimated from oil/water level readings.
012B	Calculation based on total fluids pump capacity and run-time as measured by "hour meters". The water phase quantity is estimated from oil/water level readings.
013A	Calculation based on total fluids pump capacity and run-time as measured by "hour meters". The oil phase quantity is estimated from oil/water level readings.

TABLE 3
METHODS OF FLOW DETERMINATION

Location I.D.	Flow Determination Methodology
013B	Calculation based on total fluids pump capacity and run-time as measured by "hour meters". The water phase quantity is estimated from oil/water level readings.

SAMPLING SCHEDULE

As a minimum, end-of-the-line benzene waste sampling will be conducted on a quarterly basis, in accordance with the current Consent Decree, Paragraph 58 [Sampling (6 Mg/yr)]. The sampling program began in the 3rd Quarter 2002 under the 2001 Consent Decree, which has since been terminated, and we are now subject to the current plan upon EPA approval. The refinery may collect more samples as deemed appropriate to better characterize the benzene quantities at the sample locations (e.g., benzene concentration of the sample appears to be out of the typical historical range). All samples taken during a quarter will be included in the quarterly benzene quantity determination.

The BP Whiting Business Unit will collect a minimum of one representative aqueous sample from each benzene waste stream identified in Table 2, and one oil sample wherever it is feasible. The oil phase in some streams (e.g., sample points 001B, 011B, 012B and 013B) may not be feasible to collect in cases when there is to too little present during the sampling event. All samples taken during a quarter will be included in the quarterly benzene quantity determination for that calendar quarter. Flow weighted average benzene concentrations (with the exception of samples from 008) will be used for multiple samples per Section 7 of the plan.

SAMPLING PROCEDURES AND ANALYTICAL TESTING METHODS

The BP Whiting Business Unit will conduct benzene waste sampling consistent with and in accordance with 40 CFR §61.355(c)(3) and the current Consent Decree.

CALCULATION METHODS

Flow-weighted quarterly benzene concentration

If waste flow is constant, flow-weighted concentration is the average of samples. If waste flow is not constant, flow will be adjusted to reflect flow using the following equation, which is consistent with the test procedures of 40 CFR §61.355(c)(3)(v):

$$\overline{C} = \frac{1}{Q_t} \times \sum_{i=1}^{n} (Q_i)(C_i)$$

Where:
$\overline{C}$ = Flow-weighted quarterly average benzene concentration for waste stream, ppmw
Q_t = Total quarterly waste quantity for waste stream, Mg/calendar quarter
n = Number of waste samples
Q_i = Quarterly waste quantity for waste stream represented by C_i, Mg/calendar quarter
C_i = Measured concentration of benzene in waste sample i, ppmw

Quarterly benzene quantity

The quarterly benzene quantity is a sum of benzene contained both in water and oil phases of the waste stream. The following equation illustrates a method of the total quarterly benzene calculation:

$$Q_b = \sum_{i=1}^{m} \left(Q_i^{water} \times \overline{C}_i^{water} \right) + \sum_{i=1}^{n} \left(Q_i^{oil} \times \overline{C}_i^{oil} \right)$$

Where:
Q_b = Total quarterly benzene quantity, Mg/calendar quarter
m = Number of waste streams with water phase
Q_i^{water} = Quarterly water quantity for waste stream represented by $\overline{C}_i^{water}$, Mg/calendar quarter
$\overline{C}_i^{water}$ = Flow-weighted quarterly average benzene concentration in a water phase of waste stream i, ppmw
n = Number of waste streams with oil phase
Q_i^{oil} = Quarterly oil quantity for water phase waste stream represented by $\overline{C}_i^{oil}$, Mg/calendar quarter
$\overline{C}_i^{oil}$ = Flow-weighted quarterly average benzene concentration in an oil phase of waste stream i, ppmw

Note, if an oil sample could not be obtained during the sampling event, the concentration of benzene in the oil phase will be determined by industry's rule of thumb (100X) as follows, or by historical average in the same location.

$$\overline{C}_i^{oil} = 100 * (\overline{C}_i^{water})$$

9.0 REVISION HISTORY

Revision Level	Change(s)	Author	Date
0	Initial Issue		05/18/2001
1	Changes made to reflect comments received from USEPA (letter dated June 14, 2002). Revised Sections 2.0 – Benzene Waste Operations NESHAP control Configuration; 3.0 – End of Line (EOL) Benzene Waste Sampling Locations; 4.0 – Methods of Flow Determination		11/14/2002
2	Revised Sections 3.0 – EOL Benzene Waste Sampling Locations; 4.0 – Methods of Flow Determination		01/08/2004
3	Edited text; revised Figure 1; added Appendix B reference.	Susanne Tomajco	03/21/2006
4	Transformed into ISO document. Field-reviewed and updated. Figure 1 is now a BP drawing numbered "D-3001-G-1363".	Paolo Berta	12/06/2006
5	Added description on the Lakefront centrifuge operation. Updated tank water draw percentage based on 2005-2006 data.	Paolo Berta	3/12/2007
6	Updated plan to reflect addition of two new sampling points. Marketing Terminal: 011A & 011B.	Frank Camilli	8/8/2007 MOC in progress
7	Updated plan to reflect addition of four new sampling points: J-157: 012A/B and J-141A: 013A/B and removal of six sampling points: Lake George remediation 004, BT2 007, E Lakefront French Drains 009A/B, W Lakefront French Drains 010A/B. Sample Point 006 is split into 006A (#7 Separator Sludge) and 006B (DAF Float). Simplified the entire plan to better reflect the	Tim Chen	11/25/13

	obligations of this plan as set in the current Consent Decree. Deleted Appendix B "Example Calculations for Total Quarterly Benzene Quantity" and replaced with "Historical EOL Sampling Locations".		

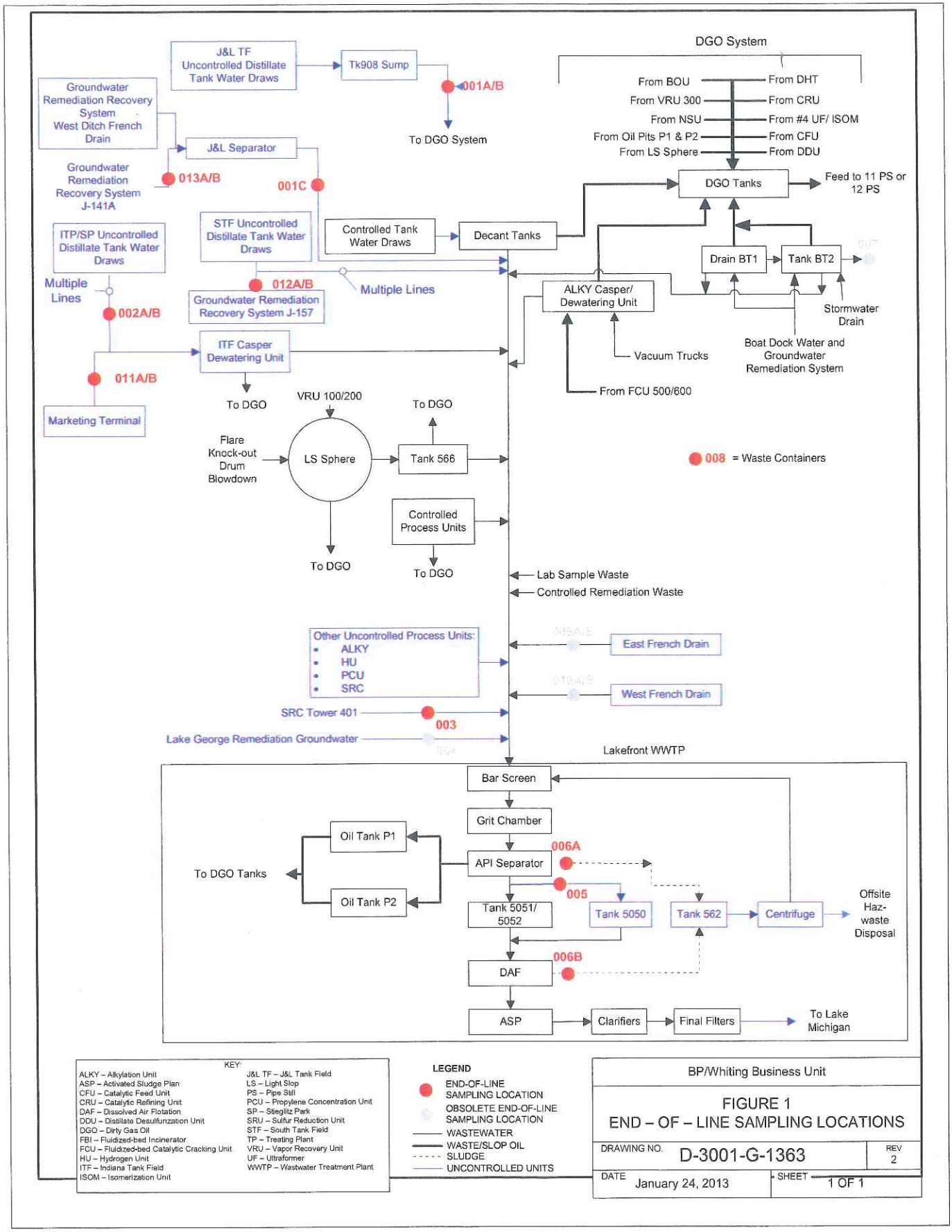
Authored by: Jim Chen
Date: November 1, 2013

Approved by: BM Herrera
Date: 11/25/13

/ljw

APPENDIX A

END-OF-LINE SAMPLING LOCATIONS DIAGRAM


DGO System
From BOU
From VRU 300
From NSU
From Oil Pits P1 & P2
From LS Sphere
From DHT
From CRU
From #4 UF/ ISOM
From CFU
From DDU
DGO Tanks
Feed to 11 PS or 12 PS
J&L TF Uncontrolled Distillate Tank Water Draws
Tk908 Sump
001A/B
To DGO System
Groundwater Remediation Recovery System West Ditch French Drain
J&L Separator
Groundwater Remediation Recovery System J-141A
013A/B
001C
ITP/SP Uncontrolled Distillate Tank Water Draws
STF Uncontrolled Distillate Tank Water Draws
Controlled Tank Water Draws
Decant Tanks
Drain BT1
Tank BT2
Stormwater Drain
Multiple Lines
012A/B
Groundwater Remediation Recovery System J-157
Multiple Lines
002A/B
ALKY Casper/ Dewatering Unit
Vacuum Trucks
From FCU 500/600
Boat Dock Water and Groundwater Remediation System
ITF Casper Dewatering Unit
011A/B
Marketing Terminal
To DGO
VRU 100/200
To DGO
Flare Knock-out Drum Blowdown
LS Sphere
Tank 566
008 = Waste Containers
Controlled Process Units
To DGO
To DGO
Lab Sample Waste
Controlled Remediation Waste
Other Uncontrolled Process Units:
ALKY
HU
PCU
SRC
East French Drain
West French Drain
SRC Tower 401
003
Lake George Remediation Groundwater
Lakefront WWTP
Bar Screen
Grit Chamber
Oil Tank P1
Oil Tank P2
To DGO Tanks
API Separator
006A
005
Tank 5051/ 5052
Tank 5050
Tank 562
Centrifuge
Offsite Haz-waste Disposal
DAF
006B
ASP
Clarifiers
Final Filters
To Lake Michigan
KEY:
ALKY – Alkylation Unit
ASP – Activated Sludge Plan
CFU – Catalytic Feed Unit
CRU – Catalytic Refining Unit
DAF – Dissolved Air Flotation
DDU – Distillate Desulfunzation Unit
DGO – Dirty Gas Oil
FBI – Fluidized-bed Incinerator
FCU – Fluidized-bed Catalytic Cracking Unit
HU – Hydrogen Unit
ITF – Indiana Tank Field
ISOM – Isomerization Unit
J&L TF – J&L Tank Field
LS – Light Slop
PS – Pipe Still
PCU – Propylene Concentration Unit
SP – Stieglitz Park
SRU – Sulfur Reduction Unit
STF – South Tank Field
TP – Treating Plant
VRU – Vapor Recovery Unit
UF – Ultraformer
WWTP – Wastwater Treatment Plant
LEGEND
END-OF-LINE SAMPLING LOCATION
OBSOLETE END-OF-LINE SAMPLING LOCATION
WASTEWATER
WASTE/SLOP OIL
SLUDGE
UNCONTROLLED UNITS
BP/Whiting Business Unit
FIGURE 1
END – OF – LINE SAMPLING LOCATIONS
DRAWING NO. D-3001-G-1363
REV 2
DATE January 24, 2013
SHEET 1 OF 1

APPENDIX B

HISTORICAL EOL SAMPLING LOCATIONS

HISTORICAL
END-OF-LINE SAMPLING LOCATIONS

Location I.D.	Location Description	Waste Stream Description	Reasons No Longer Needed
004	Between the Lake George remediation groundwater system and the process sewer	Lake George remediation groundwater	System is shutdown.
007	Ballast water surge tank BT2 at Boat Docks (infrequently used)	Stormwater, wastewater	The tank BT2 has met control standards.
009A	East French Drain sump	Oil phase collected in sump	Since 2006, the benzene quantity in both streams have consistently shown very insignificant values and never exceeded 0.05 Mg/yr
009B	East French Drain sump	Water phase collected in sump	
010A	West French Drain sump	Oil phase collected in sump	
010B	West French Drain sump	Water phase collected in sump	